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## BOOK REVIEWS.

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*Elements of Plane Surveying.* By SAMUEL MARX BARTON. Boston: D. C. Heath & Co., 1904. Pp. viii + 255.

THOUGH the author has fallen prey to the all too prevalent custom of attempting in a single brief volume to cater to the demands of a constituency too diverse to admit of any great unity and solidarity of treatment of his subject, still he has quite well met the needs of one class. The class whose interests seem to have been consulted, in the main, is that of the strong high-school, or early college, student of mathematics who feels he would like to know for what all these years of barren formalism are supposed to prepare one, at any rate. The book will give him many interesting and informing examples of the way the principles of geometry and trigonometry are used in practical work in surveying. The engineer, however, either actual or prespective, will want fuller and less mathematical detail touching the technical points of professional practice.

That the standard topics of surveying are treated will be clear from the captions of the chapters: (1) "Instruments, Their Adjustments and Uses;" (2) "Chain Surveying;" (3) "Compass Surveying;" (4) "Computation of Areas;" (5) "Transit Surveying;" (6) "Leveling;" and (7) "Tables." The tabular matter merits a few words. The following ten short tables are in the body of the book; mean refraction; errors in azimuth; refraction correction, lat.  $40^{\circ}$ ; latitude coefficients; daily variation of the needle; declination formulæ; declination values and annual change; azimuths of polaris at elongation; local mean time of culminations and elongations of polaris; pole distance of polaris. The last 111 pages of the book contain the following useful tables: a table of squares, cubes, square roots, and cube roots; of chords; stadia tables; six-place logarithms of numbers and of trigonometric functions; the natural functions to five places; and an auxiliary table for small angles. The writer desires to protest against the insertion of six-place tables in texts on plane surveying. Five-place tables satisfy every demand of the student, whether in school or in ordinary field work, and the saving in time and labor is imperatively demanded. For all cases in which a five-place table will not suffice a seven-place is necessary. The six-place has no ground to stand on. As a matter of fact, no better proof exists that mathematical teachers are generally out of touch with real demands than that they continue to load texts with six-place tables. Let the six-place table pass, in theory as it has in practice.

The reviewer can take space here for only one suggestion of a pedagogical character, which is brought out by this text. If high schools were encouraged to substitute for their lame attempts to teach such matters as college algebra a course in such a text as this, aided, of course, by the necessary instruments, in course of a brief space we might hope to see an infusion of real life into secondary mathematics. Such subjects as this and trigonometry, both plane and solid, are high-school subjects in a pre-eminent sense. So-called "college," or "advanced," algebra is pre-eminently not a high-school subject, and the sooner certain technical colleges find this out and act accordingly, the sooner may we effect a distinct improvement in high-school mathematics.

From a mathematical student's point of view the book is a clear, simple, and educative treatment of the fundamental problems of surveying, From this same point of view we ought to have a larger number of such mathematical texts as this, and a much smaller number of the logic-tight sort for early college students.

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*Advanced Course in Algebra.* By WEBSTER WELLS. Boston: D. C. Heath & Co. Pp. vii + 581.

TO UNDERTAKE to say anything to the mathematical public of the central West about a Wells algebra is to undertake to tell that public something of which it is already well aware. Commendation of this text which, if it does not succeed with the mathematical public, is the only one of an old and numerous series that will have failed, must perforce be stale and commonplace. Criticism of such a book opens the critic to the danger of being charged with iconoclasm. The writer herewith disclaims the possession of any desire to pose either as an educational reformer or as a public nuisance, if there be any difference between the two types. Suffice it to say that the present book is characterized by about the same proportion of merits and demerits as the rest of the series. In fact, the author tells us the present book "follows in the main the author's *College Algebra*."

This book timidly introduces the subject of graphical representation in chapter 14. Two things are suggested at this point. First, it is not the elements of analytical geometry, or graphical representation, *per se*, that is so much needed in the algebra as it is graphical algebra. Less fussiness about the matter of getting ready to represent things graphically, and more graphing equations is desired without any philosophical talk about the scheme itself. The second thing is that there is no very important reason for graphs in algebra, unless they come in time to do some good in the way of illuminating equations and algebraic expressions. The pupil is familiarized, at the very beginning of algebra, with the method of displaying on a horizontal or vertical straight line the positive and negative series of numbers toward one side and the other from a point marked zero. It is easy enough for even the first-year high-school boy, or girl, to see that, if the zero of a horizontal and of a vertical line be brought together, we have at once a scheme for keeping separate on the same drawing any two different magnitudes, by measuring one magnitude off parallel to the vertical and the other parallel to the horizontal. This is all that is either necessary or desirable at the outset, since the center of gravity of attention should be on learning the equation—not on learning graphing. With such procedure we should then have a scheme for making the solution of simultaneous equations mean something worth while to the pupil. The author evidently dissents from this view.

The most conspicuous frailty of the book consists in overexplanation. Cautions, suggestions, and explanatory remarks to the minutest detail, whenever any new element enters in any form, make work practically prohibitive of thought on the student's part. Such study will result perhaps in a perspicuous, but withal a static, frame of mind on the part of the learner. He sinks into a mere manipulator. He will come to understand what others have done and explained for him, and will add to his power